

WHAT IS CLAIMED IS:

1. A transmitter for transmitting an alternating magnetic field to a receiver, which is implanted in a human's or animal's body to supply energy drawn from the alternating magnetic field to an energy consuming implant in the human's or animal's body, the transmitter comprising:

a coil adapted to generate the alternating magnetic field in a desired direction towards the implanted receiver, said coil having a longitudinal extension, a front end to be directed towards the receiver and a rear end to be directed away from the receiver, and

a shield adapted to shield the environment from the alternating magnetic field generated by said coil except at said front end of said coil, said shield including a magnetizable core extending in said coil and a magnetizable casing integrated with said core and surrounding said rear end of said coil and the circumference of said coil along at least a portion of said longitudinal extension of said coil.

2. A transmitter according to claim 1, wherein said casing completely surrounds said coil except said front end thereof.

3. A transmitter according to claim 2, wherein said core wholly extends along said longitudinal extension of said coil.

4. A transmitter according to claim 1, wherein said casing surrounds the circumference of said coil along a portion of said longitudinal extension of said coil.

5. A transmitter according to claim 4, wherein said core and/or coil extend past said casing along said longitudinal extension of said coil, as seen in the direction towards said front end of said coil.

6. A transmitter according to claim 1, wherein said casing comprises a circular cylindrical wall and a circular gable wall joined to said cylindrical wall, said core extends centrally in said cylindrical wall from said gable wall and said coil is applied on said core with said rear end of said coil facing said gable wall.

7. A transmitter according to claim 6, wherein said cylindrical wall is provided with cut-outs.

8. A transmitter according to claim 1, wherein said shield is made of ferrite.

9. A transmitter according to claim 1, further comprising a plastic box, in which said coil and shield are arranged such that they are located at a distance, in the order of centimeters, from an operator's hand, when the operator holds said transmitter during operation.

10. An apparatus for wireless transfer of energy from outside a human's or animal's body to an energy consuming medical device implanted in the human's or animal's body, comprising:

a transmitter operable from outside the human's or animal's body for transmission of an alternating magnetic field,

a receiver implantable in the human's or animal's body for receiving said alternating magnetic field and for drawing energy from said alternating magnetic field to be supplied to the energy consuming implanted medical device, said transmitter including at least one coil for generating said alternating magnetic field in a desired direction towards said receiver, said coil having a longitudinal extension, a front end to be directed towards said receiver and a rear end to be directed away from said receiver, and

at least one shield adapted to shield the environment from said alternating magnetic field generated by said coil except at said front end of said coil, said shield including a magnetizable core extending in said coil and a magnetizable casing integrated with said core and surrounding said rear end of said coil and the circumference of said coil along at least a portion of said longitudinal extension of said coil.

11. An apparatus according to claim 10, wherein said casing completely surrounds said coil except said front end thereof.

12. An apparatus according to claim 11, wherein said core wholly extends along said longitudinal extension of said coil.

13. An apparatus according to claim 10, wherein said casing surrounds the circumference of said coil along a portion of said longitudinal extension of said coil.

14. An apparatus according to claim 13, wherein said core and/or coil extends past said casing along said longitudinal extension of said coil, as seen in the direction towards said front end of said coil.

15. An apparatus according to claim 10, wherein said casing comprises a circular cylindrical wall and a circular gable wall joined to said cylindrical wall, said core extends centrally in said cylindrical wall from said gable wall and said coil is applied on said core with said rear end of said coil facing said gable wall.

16. An apparatus according to claim 15, wherein said cylindrical wall is provided with cut-outs.

17. An apparatus according to claim 10, wherein said shield is made of ferrite.

18. An apparatus according to claim 10, further comprising a plastic box, in which said coil and shield are arranged such that they are located at a distance, in the order of centimeters, from an operator's hand, when the operator holds said transmitter during operation.

19. An apparatus for wireless transfer of energy from outside a human's or animal's body to an energy consuming medical device implanted in the human's or animal's body, comprising:

a first transmitter operable from outside the human's or animal's body for transmission of a first alternating magnetic field,

a second transmitter operable from outside the human's or animal's body for transmission of a second alternating magnetic field,

a receiver implantable in the human's or animal's body for receiving and drawing energy from said first and second alternating magnetic fields to be supplied to the energy consuming implanted medical device, said first and second transmitters including first and

second coils for generating said first and second alternating magnetic fields, respectively, in two different directions towards said receiver, each of said first and second coils having a longitudinal extension, a front end to be directed towards said receiver and a rear end to be directed away from said receiver, and

first and second shields adapted to shield the environment from said first and second alternating magnetic fields, each of said first and second shields including a core extending in the associated coil and a magnetizable casing integrated with said core and surrounding said rear end of said coil and the circumference of said coil along at least a portion of said longitudinal extension of said coil.

20. An apparatus according to claim 19, wherein each said casing of said first and second shields completely surrounds its coil except said front end thereof.

21. An apparatus according to claim 20, wherein each said core wholly extends along said longitudinal extension of its coil.

22. An apparatus according to claim 19, wherein each said casing surrounds the circumference of its coil along a portion of said longitudinal extension of said coil.

23. An apparatus according to claim 22, wherein each said core and/or coil extends past its associated casing along said longitudinal extension of its coil, as seen in the direction towards said front end of said coil.

24. An apparatus according to claim 19, wherein each said casing comprises a circular cylindrical wall and a circular gable wall joined to said cylindrical wall, said core associated

with said casing extends centrally in said cylindrical wall from said gable wall and said coil associated with said casing is applied on said core with said rear end of said coil facing said gable wall.

25. An apparatus according to claim 24, wherein said cylindrical wall is provided with cut-outs.

26. An apparatus according to claim 19, wherein each shield is made of ferrite.

27. An apparatus according to claim 19, further comprising first and second plastic boxes, in which said first and second coils, respectively, and first and second shields, respectively, are arranged such that they are located at a distance, in the order of centimeters, from an operator's hand, when the operator holds said first or second transmitter during operation.

28. A method for harmless wireless transfer of energy to an energy consuming medical device implanted in a human's or animal's body, comprising:

implanting in the human or animal a receiver capable of receiving an alternating magnetic field and of drawing energy from the alternating magnetic field to be supplied to the energy consuming medical device,

manually holding external to the body a transmitter capable of transmitting the alternating magnetic field, the transmitter including a coil for generating the alternating field, the coil having a longitudinal extension, a front end directed away from the hand holding the transmitter and a rear end facing the hand holding the transmitter,

transmitting by means of the transmitter the alternating magnetic field to the implanted receiver, and

shielding by means of a shield the hand holding the transmitter from the alternating magnetic field generated by the coil, the shield including a magnetizable core extending in the coil of the transmitter and a magnetizable casing integrated with the core of the transmitter and surrounding the rear end of the coil and the circumference of the coil along at least a portion of the longitudinal extension of the coil.

29. A method for harmless wireless transfer of energy to an energy consuming medical device implanted in a human's or animal's body, comprising:

implanting in the human or animal a receiver capable of receiving an alternating magnetic field and of drawing energy from the alternating magnetic field to be supplied to the energy consuming medical device,

providing an external transmitter capable of transmitting the alternating magnetic field and including a coil for generating the alternating field, the coil having a longitudinal extension, a front end and a rear end,

positioning the transmitter relative to the body so that the front end of the coil is directed towards the receiver and the rear end of the coil is directed away from the receiver,

transmitting by means of the transmitter the alternating magnetic field to the implanted receiver, and

shielding by means of a shield the environment from the alternating magnetic field generated by the coil except at the front end of the coil, the shield including a magnetizable core extending in the coil of the transmitter and a magnetizable casing integrated with the core of the transmitter and surrounding the rear end of the coil and the circumference of the coil along at least a portion of the longitudinal extension of the coil.